IN THE SPECIFICATION

[0019] The engine 110 of FIGURE 1 also includes and a variable compression ratio ("compression ratio setting") apparatus 170. In a non-limiting embodiment, the variable compression ratio apparatus 170 is operated to vary the effective length of the connecting rod 114, and thus the clearance volume and compression ratio of the engine. Such an apparatus is described, for example, in U.S. ~~Application Serial No. 09/682,263~~ Patent No. 6,394,047, entitled "Connecting Rod for a Variable Compression Engine," which is owned by the assignee of the present invention and is hereby incorporated by reference in its entirety. The actual construction and configuration of the variable compression apparatus shown in FIGURE 1 is not at all intended to limit the scope of claim protection for the inventions described herein.

[0024] Referring now to FIGURE 3, a preferred method for operating a discretely variable compression ratio internal combustion engine includes the steps of determining the rotational speed (RPM_{eng} or engine_speed) of the engine, step 302, determining the air flow (aircharge) into the engine, step 304, and determining the compression ratio operating state of the engine, step 306. Engine_speed can be determined using a speed sensor coupled to an engine crankshaft, as shown for example in FIGURE 1, or any other method known in the art. Aircharge is also determined using any known method, including for example using a MAF sensor disposed in the engine intake manifold as shown in FIGURE 1. The compression ratio operating mode can be determined using any known methods, including using a combustion pressure sensor disposed in one or more of the cylinders, or by using a piston position sensor or other sensor coupled to the engine and/or the compression ratio setting apparatus of the engine. The compression ratio operating state can also be derived or inferred using any suitable method, for example as disclosed in U.S. ~~Application Serial No.'s _____ (Attorney Docket No. 201-0838) and _____ (Attorney Docket No. 201-0839)~~ Patents No. 6,745,619 and 6,612,288 entitled "Diagnostic Method for Variable Compression Ratio ~~Internal Combustion~~ Engine," which are also owned by the assignee of the present invention and [[is]] which are hereby incorporated by reference in their entirety.